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| 10/532,827 | 04/26/2005 | Naoki Hase | 052478 | 8889 |

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| EXAMINER |
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GOFF II, JOHN L

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| ART UNIT | PAPER NUMBER |
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1791

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01/23/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/532,827

Applicant(s)

HASE ET AL.

Examiner

John L. Goff

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1/7/08.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/29/07 has been entered.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (WO 01/32418 with U.S. Patent 7,101,455 used as a translation) in view of Minami et al. (U.S. Patent 4,805,690) and as evidence the American Heritage Dictionary definition of "room temperature".

Hase discloses a continuous method of producing a laminate suitable for use as a circuit board comprising providing a heat-resistant film including a resin containing a thermal fusible component (2 of Figure 1(a)), providing upper and lower metallic foils (1 of Figure 1(a)) (e.g. copper or steel), providing protective materials (3 of Figure 1(a)), laminating the film, foils, and protective materials by pressing the substrates in a heated roll laminating apparatus (4 of Figure 1(a)) operated at 200 °C or higher to form a laminate (6 of Figure 1(a)) of the film bonded to the foils and the protective materials slightly contacted with the laminate, cooling the laminate, and removing the protective materials from the laminate (8 of Figure 1(a)) (Figure 1(a) and Column 4, lines 13-19 and Column 8, lines 16-39 and Column 11, lines 39-61). Hase is silent as to controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion, it being noted Hase is not limited to any particular cooling means (Column 8, lines 29-39). Minami disclose a cooling roller for continuous cooling of a laminate that evenly and quickly cools the laminate across its full width to prevent any defects in quality of the laminate due to uneven cooling, i.e. considered controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion (Column 1, lines 7-14 and 41-44 and Column 2, lines 23-25 and Column 4,

lines 52-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to cool the laminate including metallic foils as taught by Hase using the cooling roller shown by Minami to evenly and quickly cool the laminate across its full width.

Regarding the limitation of “wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)”, Minami teach as exemplary a lamination temperature of 260 °C and cooling to room temperature considered by the examiner to be 25 °C or below such that controlling the temperature in a width direction of the laminate in a cooling process as taught by Hase as modified by Minami includes controlling the temperature within the range of 180 °C to (lamination temperature - 100 °C). In the event it is shown Hase as modified by Minami does not necessarily teach the claimed temperature range the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the lamination temperature in Hase as modified by Minami any of the temperatures suggested by Hase followed by controlled cooling of the laminate to any of the temperatures suggested by Hase such as room temperature a temperature conventionally considered below 25 °C (as evidenced by the American Heritage Dictionary definition of room temperature) to form a dimensionally stable laminate which temperatures are considered to meet the limitation of “wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)”.

Regarding claim 5, Hase teaches the heat-resistant film may comprise a multilayer of a non-thermoplastic polyimide film having thermoplastic polyimide layers, i.e. a resin containing a thermally fusible component, provided on upper and lower surfaces thereof (Column 11, lines 39-61).

Regarding claim 6, Hase teaches the thermally fusible component of the heat-resistant film contains a thermoplastic polyimide in an amount of 50% by weight or more based on 100% by weight of the thermally fusible component (Column 5, lines 46-49).

Regarding claim 7, Hase teaches the metallic foil may comprise a copper foil having a thickness of 50 μm or less (Column 13, lines 24-30).

Regarding claim 8, Hase teaches the protective material may comprise a heat resistant polyimide film which is considered a non-thermoplastic polyimide film (Column 10, lines 1-10 and Column 11, lines 39-61 and Column 26, lines 49-50).

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase in view of Akashi et al. (WO 01/36122 with U.S. Patent 6,615,633 used as a translation) or Yamagishi (JP 03266626 and see also the abstract) and as evidenced by the American Heritage Dictionary definition of "room temperature".

Hase is described in full detail above. Hase is silent as to controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion, it being noted Hase is not limited to any particular cooling means (Column 8, lines 29-39). It is noted Hase teaches a continuous process of heating a thermoplastic polymer considered to an at least partially molten state for fusing with a steel sheet in a hot roll process at temperatures including 300 °C followed by cooling to room temperature. It was known in continuous hot rolling of a steel sheet at a temperature between 100 and 750 °C followed by cooling that the cooling is performed by initially heating the ends, i.e. lateral edges, of the sheet to within ± 50 °C of the center portion of the sheet thereby controlling the temperature in the

width direction during the cooling process of the sheet to prevent end waviness in the sheet as shown by Akashi (Column 1, lines 8-21 and Column 5, lines 5-12 and 40-43 and Column 6, lines 40-49 and Column 7, lines 15-19). Further it was known in cooling a thermoplastic polymer sheet in an at least partially molten state that the cooling is performed by initially heating the ends, i.e. lateral edges, of the laminate without heating the center portion of the sheet thereby controlling the temperature in the width direction during the cooling process of the sheet to prevent end waviness in the sheet as shown by Yamagishi (See the Figures and abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to cool the laminate including metallic foils as taught by Hase by initially heating the ends, i.e. lateral edges, of the laminate without heating the center portion of the laminate as shown by Akashi or Yamagishi to control the temperature in the width direction during the cooling process of the laminate and prevent end waviness in the laminate. Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the temperature difference between the heated ends and center of the laminate as taught by Hase as modified by Akashi or Yamagishi as a function of preventing end waviness in the laminate wherein a temperature of up to 50 °C is specifically suggested by Akashi.

Regarding the limitation of “wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)”, Minami teach as exemplary a lamination temperature of 260 °C and cooling to room temperature considered by the examiner to be 25 °C or below such that controlling the temperature in a width direction of the laminate in a cooling process as taught by Hase as modified by Akashi or Yamagishi includes controlling the

temperature within the range of 180 °C to (lamination temperature - 100 °C). In the event it is shown Hase as modified by Akashi or Yamagishi does not necessarily teach the claimed temperature range the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the lamination temperature in Hase as modified by Akashi or Yamagishi any of the temperatures suggested by Hase followed by controlled cooling of the laminate to any of the temperatures suggested by Hase such as room temperature a temperature conventionally considered below 25 °C (as evidenced by the American Heritage Dictionary definition of room temperature) to form a dimensionally stable laminate which temperatures are considered to meet the limitation of “wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)”.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1, 2, 5, 6, and 8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455 in view of Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature". Claims 1-4 of U.S. Patent No. 7,101,455 fully encompass claims 1, 2, and 5-8 of the instant application except for a teaching of controlling the temperature in a width direction of the laminate in a cooling process such that the temperature of the ends of the laminate is the same as or higher than that of the center portion which is obvious in view of Minami or Akashi or Yamagishi as described above.

8. Claims 3, 4, and 7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455, Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" as applied to claims 1, 2, 5, 6, and 8 above, and further in view of Tokabayashi et al. (JP 04033848). Claims 1-4 of U.S. Patent No. 7,101,455, Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" as described above fully encompass claims 3 and 4 except for a specific teaching of using a heated roll laminating apparatus as the thermal-press forming device. Tokabayashi et al. are exemplary of laminating copper foils and a heat-resistant film in the formation of a circuit board wherein the foils and film are laminated in a heated roll laminating apparatus (See the abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the thermal-press forming device taught by claims 1-4 of U.S. Patent No. 7,101,455 as modified

by Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" a heated roll laminating apparatus as shown by Tokabayashi et al. to continuously form the laminate. Regarding claim 7, claims 1-4 of U.S. Patent No. 7,101,455 are silent as to the metal comprising copper foil. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the metal layer in claims 1-4 of U.S. Patent No. 7,101,455 as modified by Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" a copper foil as a known metal layer for forming a substrate useful as a circuit board as shown by Tokabayashi wherein absent any unexpected results it would have been obvious to one of ordinary skill in the art to determine the specific thickness of the foil as a function of the specific use of the circuit board as doing so would have required nothing more than ordinary skill and routine experimentation.

Response to Arguments

9. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground(s) of rejection.

The previous rejections over Iizuka et al. (JP 2002172639 and see also the machine translation) and/or Okochi et al. (JP 04080348 and see also the abstract) are withdrawn in view of the new ground(s) or rejection presented above.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571) 272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John L. Goff
Primary Examiner
Art Unit 1791